

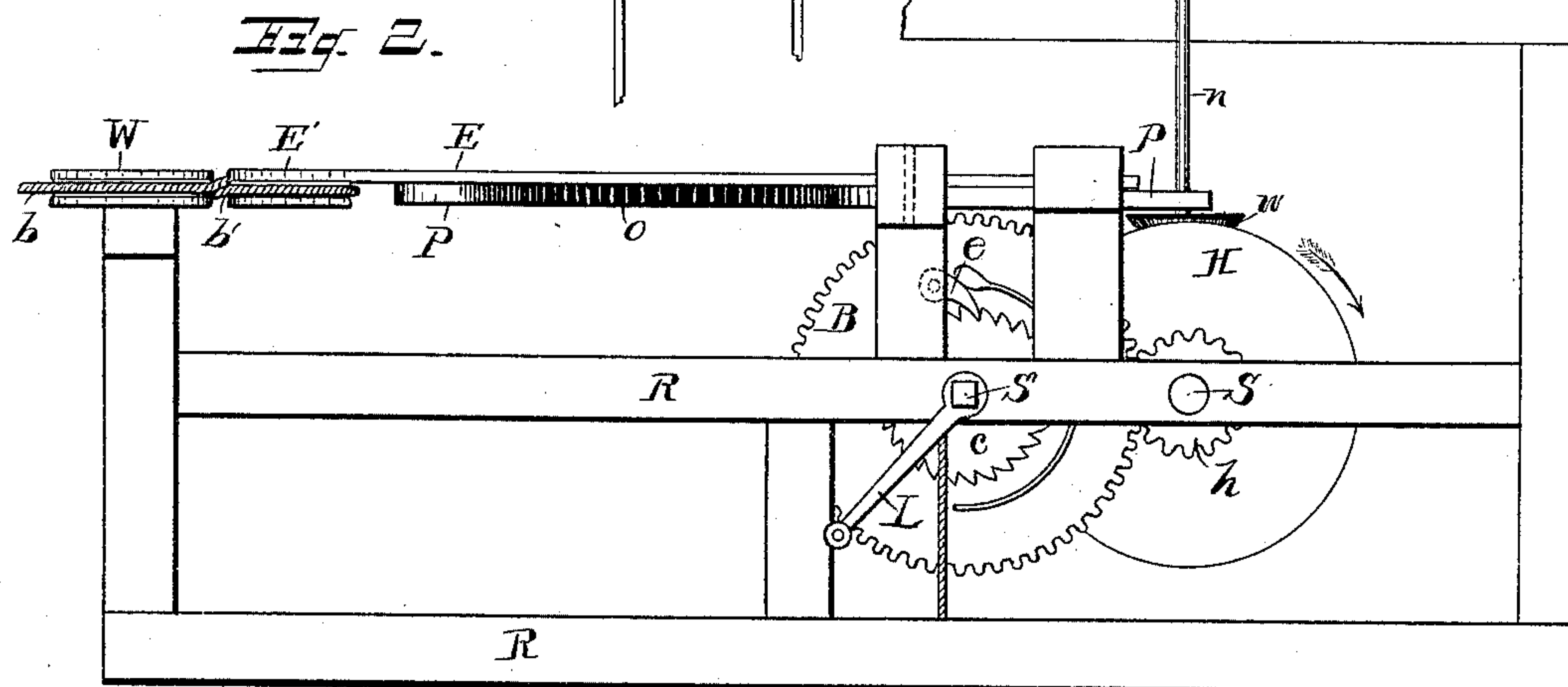
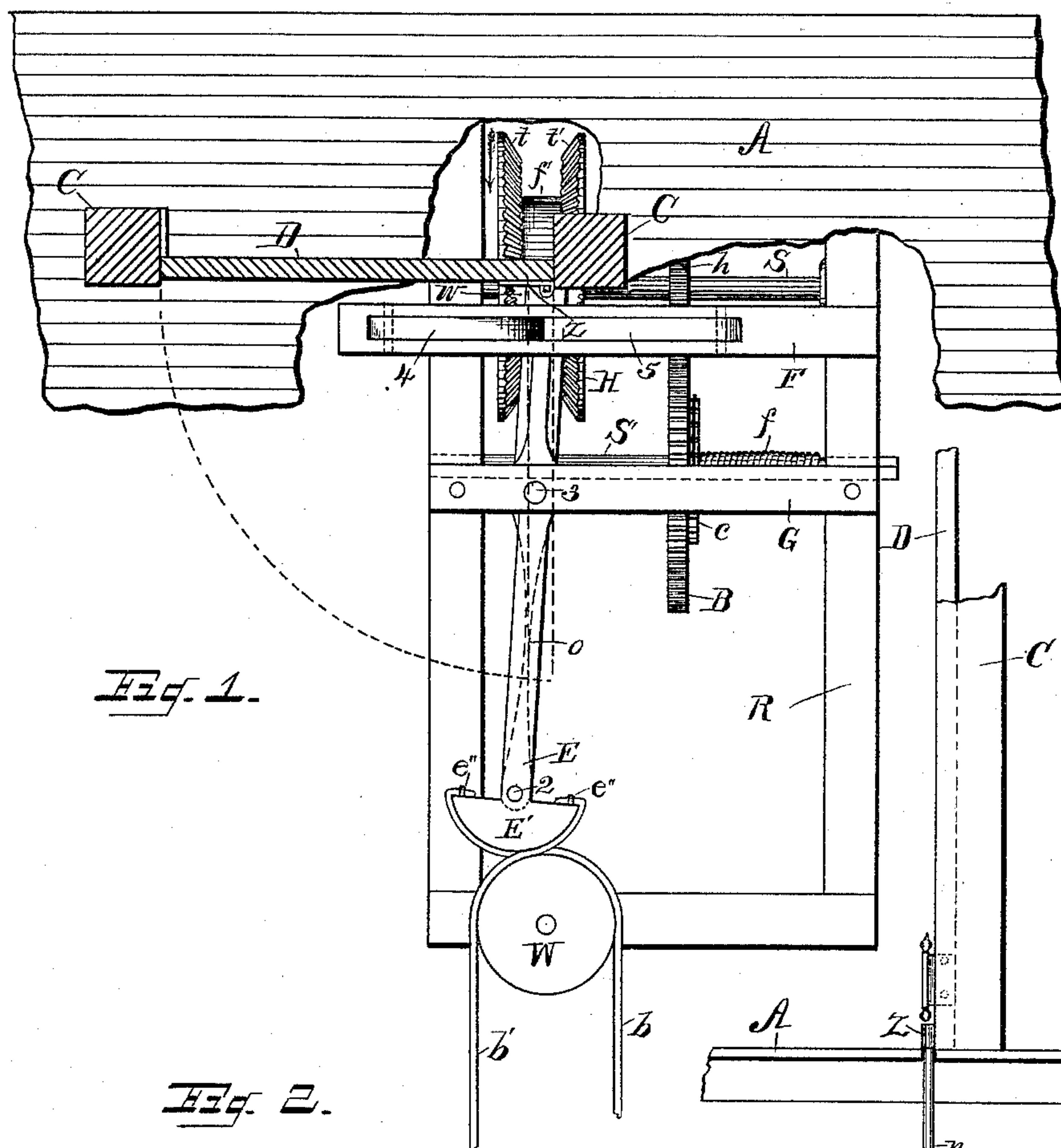
(No Model.)

3 Sheets—Sheet 1.

D. McVEAN.  
DOOR ACTUATING DEVICE.

No. 432,066.

Patented July 15, 1890.

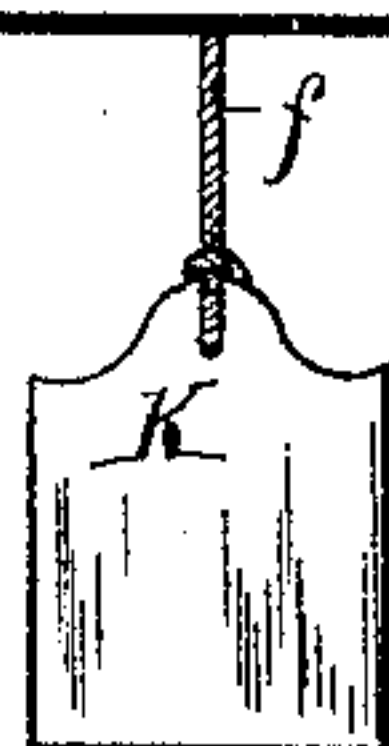


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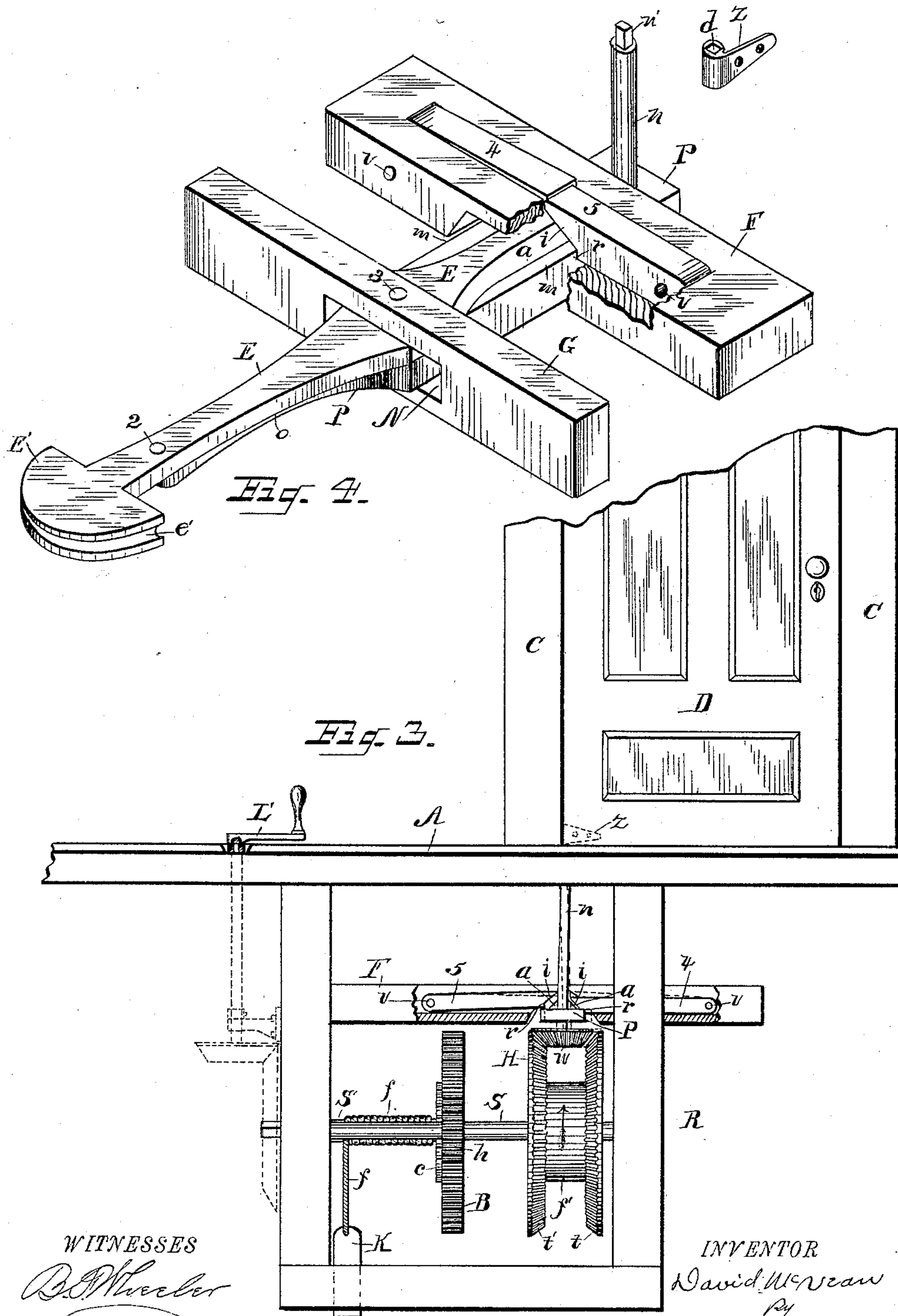
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(No Model.)

3 Sheets—Sheet 3.

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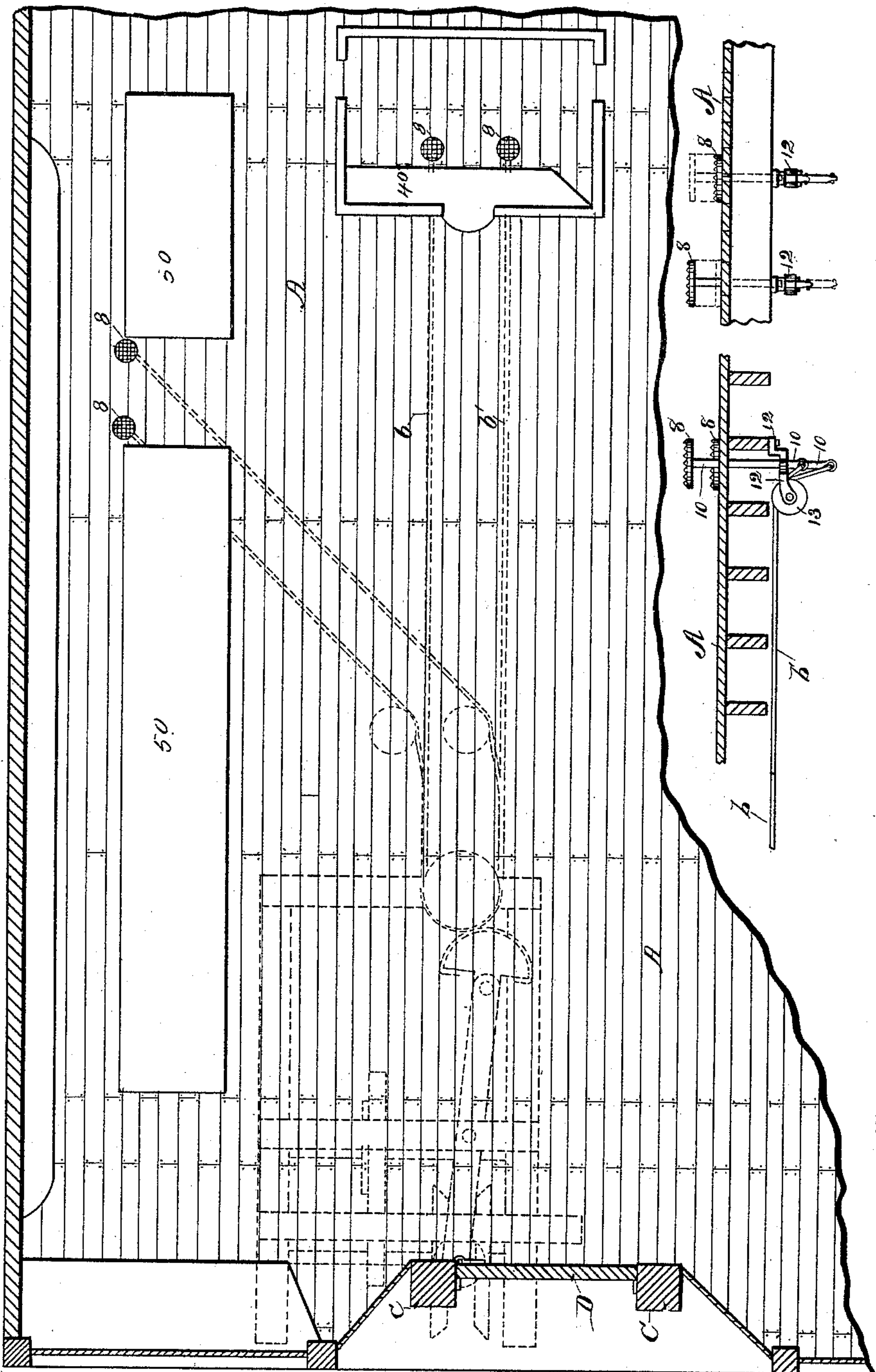


Fig. 7.

Fig. 6.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

DAVID McVEAN, OF LAPEER, MICHIGAN.

## DOOR-ACTUATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 432,066, dated July 15, 1890.

Application filed October 30, 1889. Serial No. 328,735. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID McVEAN, a citizen of the United States, residing at Lapeer, in the county of Lapeer and State of Michigan, have invented certain new and useful Improvements in Door-Actuating Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an automatic device for opening and closing doors, especially adapted for store use; and it consists in a certain arrangement of mechanism whereby the front door of a store may be opened or closed by the operator at any one of several points within the store and at a distance from the door, also serving as a spring-force to hold the door either closed or open, as desired, all of which will be hereinafter fully set forth, and the essential features of the device pointed out particularly in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view, a portion of the floor being broken away, showing the mechanism located in a frame beneath the floor and the door held in the closed position, the door and casing being in horizontal section. Fig. 2 is a side elevation of Fig. 1, showing the connection with the door, also showing the driving-weight and means for winding. Fig. 3 is a front elevation of Figs. 1 and 2, and showing by dotted lines at the left an arrangement of mechanism for winding the device through the floor of the store-room. Fig. 4 is an enlarged isometrical view of the detached shifting and locking mechanism, which will be hereinafter more fully described. Fig. 5 is a plan view of a portion of the floor of the store, showing by dotted lines the manner in which the power to operate the device in opening and closing the door may be conveyed from various points in the store. Figs. 6 and 7 are details to be referred to.

As indicated in the drawings, A represents

the floor, C C the door-casing, and D the door, said door being hung to swing inward, as is common with outside doors.

The operating mechanism is mounted in a frame, as R, located under the door beneath the floor and secured to the flooring or to the joists of the floor. The shaft S' crosses the frame transversely, its ends being journaled therein and one end extending to receive the crank L. Loosely mounted on said shaft is the large gear-wheel B, provided with the spring-actuated pawl e. The rack c is rigidly secured on the shaft S' close to the face of the gear-wheel B. The pawl e of said wheel engages with the teeth of said rack. The rope f, supporting the weight K, is attached to the shaft S' and wound thereon. By the arrangement as above described it will be seen that as the shaft S' is revolved by means of the crank L to wind the weight K the pawl e of the gear-wheel B will slip past the teeth of the rack c, said wheel B remaining stationary, and when the shaft S' is revolved by means of the weight and rope the pawl e will engage the teeth of the rack c, thus turning the gear-wheel B and operating the remaining mechanism, to which it is geared, as will be readily understood. The shaft S also crosses the frame R transversely and is journaled at its ends therein, said shaft carrying the pinion h and the double gear-wheel H, having the inner beveled gear-faces t t' and annular hub f'. The pinion h of shaft S meshes with the large gear B on the shaft S', as clearly shown in Figs. 1, 2, and 3, whereby the shaft S and double gear-wheel H are driven. The vertical shaft n, having at its lower end the beveled gear w, passes loosely through the free end of the shifting-lever P, then through the floor directly under the hinge of the door, and on a vertical line therewith, its square end n' entering the square hole d in the hinge-plate Z, which is secured to the base of the door, as clearly shown in Figs. 1 and 2. The beveled gear w lies horizontally between the inner cogged faces t t' of the wheel H and is adapted to alternately engage therewith. Said cogged faces t t' are separated by means of the annular hub f' and at such distance apart that when the gear w is engaged with the in-



ner cogged face on one side of said wheel H it will be free from contact with the cogged face on the opposite side, as shown in Fig. 3.

The shifting and locking mechanism consists of the pivoted shifting-lever P, the pivoted key-arm E, and the gravitating locking-dogs 4 and 5. (See Fig. 4.) The shifting-lever P passes through the opening N in the cross-piece G and under the cross-piece F, which is cut out on its under face to receive said lever and permit of its horizontal oscillation. The outer end of the lever receives the vertical shaft *n*, which passes therethrough, said lever also having the reduced spring portion *o* near its rear end. The key-arm E also passes through the opening N in the cross-piece G on top of the lever P, and both are pivoted thereto, as shown at 3, Fig. 4. The key-arm is also pivoted to the rear end of the shifting-lever P, as shown at 2 in Fig. 4, and is provided at its rear end with the circular head E', having the circumferential groove *e'*, which receives the cables *bb'*. The forward end of the key-arm, having the beveled face *a* on each side thereof, extends under the meeting ends of the dogs 4 and 5, which are pivoted at *v* in the cross-piece F, the meeting ends of said dogs being beveled on their under face, as shown at *i*, to coincide with the bevel *a* of the key-arm E, said dogs being also provided on their under face with the shoulder *r*, which is adapted to engage with the square shoulders *m m*, respectively, of the shifting-lever P, forming a lock. The cables *b b'* are secured at *e''* to the right-angled portion of the head E', or rear end of the key-arm, and passing around the circle of said head from each side are crossed at their meeting point and pass around the periphery of the pulley W, as clearly shown in Fig. 1. By means of these cables the mechanism is operated to open and close the door, as will be hereinafter described.

In Figs. 1, 2, and 3 the tendency of the weight K, through the medium of the gearing B and *h*, is to revolve the double gear-wheel H in the direction of the arrow. The beveled gear *w* at the lower end of the vertical shaft *n*, having engagement with the inner cogged face *t'* of the wheel H (see Figs. 1 and 3) and the upper end of said shaft being secured in the hinge-plate Z on the base of the door, said door is thereby held in the closed position. The shoulder *r* of the dog 4, engaging the square shoulder of the shifting-lever P, locks said lever in position, thus holding the gear-wheel *w* and the cogged face *t'* of the gear H in positive contact, as clearly shown in Figs. 1 and 3.

When the parts are in position, as shown in Fig. 1, and it is desired to open the door from a point in the interior of the room, the cable *b*, by an arrangement hereinafter described, is drawn horizontally, whereby the head end E' of the key-arm E is swung to the right, the forward end of the shifting-lever being held by the shoulder *r* of the dog (see

Fig. 4) and the rear end of said lever being pivoted to the key-arm E. As said key-arm is swung the spring portion *o* of the shifting-lever will yield, thus exerting the full force of the spring on the outer end of said lever, which is held by the dog 4 until the beveled portion *a* of the key-arm engages with the beveled under face *i* of said dog, when said dog will be raised, disengaging it from the lever P, when the force of the spring portion *o* will quickly shift said lever, carrying the gear *w* into contact with the inner opposite cogged face *t* of the wheel H, when the revolution of said wheel will rotate the shaft *n* and open the door in the direction shown by dotted lines in Fig. 1. As the lever P is shifted the dog 5 will drop down and engage the shoulder of said lever, thus holding the gear *w* in contact with the cogged face *t* of the wheel H, as shown by dotted lines in Fig. 3. To close the door, a horizontal force is exerted on the cable *b'*, which will swing the head end of the key-arm E to the left, causing the outer end of said arm to raise the dog 5, when the force of the spring portion *o* will shift the outer end of the lever P, carrying the gear-wheel *w* into contact with the cogged face *t'* of the wheel H, when the revolution of said wheel will rotate the shaft *n* and close the door, as shown in Fig. 1. It will now be apparent that the weight K will act as a force to keep the door closed or hold it open, as desired. When the parts are in position, as shown in Fig. 1, the door may be opened by hand, and when released the force of the weight will reclose it, or, if it is desired that the door shall stand open, by shifting the gear-wheel *w* into contact with the cogged face *t* of the wheel H the door will open, and should it be closed without again shifting the wheel *w* the force of the weight will reopen it.

Figs. 5, 6, and 7 show the arrangement for operating the device to open and close the door from various points in the interior of the room. In Figs. 6 and 7, 8 represents a roughened disk or tread-plate, which is mounted on a vertical rod 10. Said rod extends downward through the floor, its lower end passing through and being supported in the bracket 12, which is secured to the joist, said bracket also carrying the pulley 13. The cable passes over said pulley and is attached to the lower end of the rod 10. By treading upon the disk 8 the rod 10 is forced downward, drawing the cable over the pulley 13 and operating the mechanism to open and close the door, as before described. The disks or tread-plates are arranged in pairs, and so that when one disk is forced down the other will rise, as shown by dotted lines in Fig. 7, thereby keeping one treadle always ready for operation. The treading-plates may be placed in the room at any point desired and connected to the main cables by means of sub-cables, as shown by dotted lines in



Fig. 5. By this arrangement a person may remain at the rear of the store-room and open and close the front door at pleasure.

In Fig. 5 the counters of a store are shown at 50. The treading-plates are arranged for convenience of the clerk. The cashier's desk is indicated at 40. The treading-plates 8 8 are shown located at a convenient point for operation by the cashier.

10 The said view 5 shows by dotted lines the main cables *b b'*, coupled to the door-actuating mechanism. The dotted lines of cables passing to the counter 50 is a sub-line coupled to the main cables, which will operate the  
15 device in substantially the same manner as the main line.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

20 1. In a device for the purpose set forth, the combination of the supporting-frame, the train of gear, weight, and winding mechanism mounted thereon, the double cog-faced gear-wheel, the pinion located between the  
25 cogged faces of said gear-wheel, the shaft coupled to the pinion, its upper end adapted to be attached to the door, and the mechanism

for shifting the pinion to engagement alternately with the cogged faces of the double-faced cog-wheel, substantially as and for the 30 purposes specified.

2. In combination with the frame, the double-faced cog-wheel made fast to the shaft journaled in said frame, a suitable power to revolve said shaft, the pinion located between the cogged faces of the double-faced 35 cog-wheel, the shaft having one end coupled to the pinion, the other end to the hinge-plate mounted on the door, the shifting and locking mechanism, consisting of the lever coupled 40 to the pinion-shaft, the key-arm coupled to the shifting-lever, said lever and arm being pivoted to the frame, the gravitating locking-dogs having engagement with said key-arm and shifting-lever, and cables passing from 45 the key-arm to and having engagement with treadles operating through the floor, as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID McVEAN.

Witnesses:

FRANK C. MASON,  
J. H. BAKER.